

# THE MINERAL INDUSTRY OF ITALY

By Harold R. Newman

Italy has ample deposits of industrial minerals but few deposits of other mineral resources. Deposits of coal, iron, metallic minerals, and petroleum are not substantial. Italy was almost entirely dependent on imports to meet its energy needs. The country's heavy reliance on foreign petroleum sources, such as Algeria and Libya, made energy security and diversification of energy sources a top concern. The estimated 2.3 trillion cubic meters of natural gas reserves, mainly in the Po Valley and offshore in the Adriatic Sea, was the fourth largest in the European Union (EU) (U.S. Energy Information Agency, 2004§<sup>1</sup>).

Italy has been a significant processor and a significant consumer of imported raw materials. It produced significant amounts of dimension stone, feldspar, marble, and pumice. In terms of world production, the country was a significant producer of cement and crude steel (table 1).

The country is a peninsula in southern Europe that extends into the central Mediterranean Sea northeast of Tunisia. Italy, which includes the islands of Sardinia and Sicily, has a surface area of 301 thousand square kilometers. In 2003, gross domestic product (GDP) in purchasing power parity was \$1.5 trillion, and GDP per capital income was \$26,800. The unemployment rate was 9% (International Monetary Fund, 2004§).

## Government Policies and Programs

Italy was 1 of the 11 founding members of the European Economic and Monetary Union and was the world's seventh leading economy in 2003. The Government has traditionally played a dominant role in the economy through regulation of ownership of large industrial and financial companies. Privatization and regulatory reform since 1994 have reduced that presence.

## Environmental Issues

Italy was focusing on three main areas—air pollution, water pollution, and strengthening its environmental laws. Environmental awareness continued to grow as the effects of climate change, air pollution, and oil spills were manifested in the cities and along the coastline.

The primary source of air pollution in Italy is from diesel- and gasoline-powered motor vehicles. Italy had one of the highest per capita levels of car ownership in the world. Marine pollution from oil spills blighted Italy's coastline, and the effect of rising water from climate change damaged buildings in the series of islands that make up Venice. The Government was strengthening environmental laws, not only in response to public opinion, but also as a result of the country's obligation as a member of the EU (U.S. Energy Information Agency, 2003§).

## Production

Among the metallic ores, lead and silver were mined; the outputs of these ores were not significant. Gold was produced by one company, Gold Mines of Sardinia Ltd. near Cagliari, Sardinia (table 3).

Industrial mineral production, which included construction materials, was the most important sector with the estimated overall output remaining about the same as that of 2002. Domestic production of natural gas was about the same as that of 2002. Crude petroleum output was estimated to have increased by about 6%. Indices of production, using latest data available, are listed in table 2.

Private and public companies own facilities for the mining and processing of minerals and mineral products (table 3). Some enterprises were under state control for such economic reasons as to maintain employment.

## Commodity Review

### *Metals*

**Bauxite and Alumina.**—Euroallumina S.p.A. was an international joint venture between Comalco Ltd. (56.2%) and Glencore AG (43.8%) and operated a plant in the Portovesme Industrial Area in southwestern Sardinia; the plant produced metallurgical-grade alumina and aluminum hydrate. In 2003, Euroallumina operated at close to its capacity of 1 million metric tons per year (Mt/yr) for the joint-venture participants that take the product in proportion to their shares. The bauxite feed material was supplied by Comalco's Wiepa Mine in Australia (Euroallumina S.p.A., 2003a§). Italy's only bauxite producer Sardabauxiti S.p.A. mined the Olmedo karst bauxite deposit, which is largely boehmitic and contains less than 5% diasporite. The company was estimated to produce 300,000 metric tons per year (t/yr) of abrasive, cement, and slag adjuster grades of bauxite.

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<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

**Copper.**—Società Metalli Marghera S.p.A., which was the leading producer of electrorefined copper in Italy, accounted for more than one-half of Italy's copper output. Copper mines in Italy were not significant, and imports of ore were small.

**Gold.**—The Paleozoic rocks of Sardinia were emerging as a potentially important new gold district in Europe. The gold mineralization was associated with intrusions and granite melts of Permo-Carboniferous age. This deformation resulted in the important mineralization in the Hercynian epoch, which hosts the large gold deposits of northwestern Spain, the Central Massif in France, Slovakia, Russia, Kazakhstan, and Uzbekistan. Gold Mines of Sardinia plc (GMS) defined a number of new gold anomalous systems associated with this metallogenic event throughout the island. The more prospective areas include Corti Rossas-Villasalto, Escalaplano, Lula, Monte Ollasteddu, San Vito, Silius, Surgus Donigala, Tertenia, and Torpe (Gold Mines of Sardinia, plc, 2003a§).

GMS, which was a joint venture of Gold Mines of Sardinia Ltd. (70%) and Progemisa S.p.A. (30%), operated the Furtei Mine, which was located north of Cagliari. Furtei was the first gold mine of GMS and the first modern gold mine in Italy.

Exploration results during 2003 included a program of reverse core (RC) drilling on the Su Masoni zone at Furtei. A total of nine RC holes were drilled for a total of 861 meters (m). The best results were 68 m at 1.62 grams per metric ton (g/t) gold, 48 m at 5.13 g/t gold, 48 m at 2.12 g/t gold, 30 m at 3.54 g/t gold, and 13 m at 7.02 g/t gold (Gold Mines of Sardinia plc, 2003b§).

GMS reported that national and regional Government grants had been made available to further the development at the Furtei project. The first grant [€2.18 million (\$2.79 million)] was from the Ministry of Industry, and the second [€1.56 million (\$1.99 million)] was from the Sardinian Regional Assessorship of Industry. These grants were contingent upon a capital investment by GMS of €7.69 million (\$9.83 million). GMS stated that the grants would allow them to gain access to interpreted zones of strong mineralization in the Furtei area (Mining Journal, 2003).

Bolivar Gold Corp. (BGC) signed a letter of intent with GMS whereby the parties will form a joint venture in which Bolivar can earn up to a 70% interest in the Monte Ollasteddu gold project upon completion of a bankable feasibility study. The project is located in southeastern Sardinia and was described as an extensive gold-in-soil anomaly that is 3.5 kilometers (km) long and up to 1 km wide with up to 12 g/t gold in soils in the central area. Previous selective sampling of individual quartz-sulfide veins returned values typically between 15 and 50 g/t; the veins were less than 1 m in width. GMS will retain a 20% interest in the project, and Progemisa SpA will retain a 10% interest (Gold Mines of Sardinia plc, 2003c§).

**Iron and Steel.**—Riva Acciaio S.p.A. announced an operating profit of €188 million (\$241 million) and a net loss of €185 million (\$237 million). Riva stated that the results reflected market conditions in flat products and environmental problems that adversely affected the cost of production at the Genoa and Taranto plants. The Taranto plant was the largest in Europe but had been forced to operate at well below capacity levels because of coke shortages brought about by local government pressure to restrict operation of its coke batteries (Metal Bulletin, 2003c).

**Lead and Zinc.**—Italy imported most of its requirements for lead and zinc concentrates. Within Italy, the small amount of lead and zinc concentrate production came from mines in Sardinia.

Glencore's Porto Vesme zinc plant was to close for 1 year from October 1 following a long battle over prohibitively high power costs. Negotiations among the Sardinian Government, regional councils, and trade unions to discuss power costs in Italy, which were the highest in Europe, failed to resolve the problem. Glencore stated that it had tried to find a solution with the Government, but an agreement could not be reached; consequently, the decision was made to close the plant, which had been operating at 20% below capacity. The Italian energy market was not fully liberalized and was controlled by Enel S.p.A., which set prices (Metal Bulletin, 2003b).

Glencore held meetings with local authorities to discuss the possibility of building its own power station adjacent to the smelter. The station could be built by 2006 and would produce 400 megawatts (MW) per year of power. Liquid gas would be imported to generate the electricity (Metal Bulletin, 2003a).

### ***Industrial Minerals***

**Cement.**—Cement is a product with a low value by weight, and as a consequence, freight costs make up a major portion of the cement price as distance increases, particularly over land. Seaborne transportation costs are less sensitive to distance. Italy's mid-Mediterranean location, and its many ports spread along the country's coastline was ideal for the seaborne cement trade (World Cement, 2003).

Italcementi Fabbriche Riunite Cemento S.p.A. was the largest of Italy's cement producers with 18 integrated mills, 9 grinding plants, and 55 quarries. Italcementi was the fifth leading international cement producer and the fourth leading in Europe (Italcementi Group, 2003a§).

Italcementi developed a white cement called Bianco TX Millennium with a specific formula that contains irradiated titanium dioxide (TiO<sub>2</sub>) in the form of anatase. In the presence of sunlight and air, the cement was highly efficient at oxidizing organic compounds deposited on it. The photocatalytic action destroys organic air pollutants, such as vehicle emissions, residential heating emissions, industrial emissions of aromatic chemical substances, or pesticides that come into contact with the cement surface by oxidizing them to carbon dioxide. As a result, the building or structure made by using this new cement would be able to maintain its original aesthetic appearance over time (Italcementi Group, 2003c§).

Buzzi Unicem Group was the second leading cement producer in Italy and the leading cement exporter. Buzzi Unicem operated 11 integrated works and 1 grinding station to produce about 8 Mt/yr of cement (International Cement Review, 2003).

**Gypsum.**—The gypsum-processing plant of Fassa S.r.l., which opened in mid-2001, continued burning and processing gypsum extracted from a nearby quarry. The plant was completely automatic from the discharge of raw gypsum to the bagging of the finished product.

**Lime.**—Unicale S.p.A., with a capacity of about 500,000 t/yr, was the leading producer of quicklime. Most of the lime production was concentrated in Lombardy (table 3).

**Potash.**—Production of potash remained suspended in 2003. The main reasons continued to be availability of ground water and the inability to remove waste material and mine water owing to environmental and ecological concerns. In Sicily, the underground mines that had been operating at Pasquasia, Racalmuto, and Realmonte remained on care-and-maintenance status.

**Pumice and Pumicite.**—Pumex S.p.A. was the world's leading producer of pumice powders. The mineral was extracted and processed on the island of Lipari, which is the largest of the Aeolian Islands off the northeast coast of Sicily. Pumex, which had a capacity of about 600,000 t/yr, was Italy's leading pumice producer. The company quarried the Mount Pelato deposit (Pumex S.p.A., 2003§).

**Stone, Dimension.**—Marble occurs in many localities from the Italian Alps to Sicily and was quarried at hundreds of operations. The most important geographic area for producing white marble is in the Apuan Alps in Tuscany, particularly near the town of Carrara. Lombardy, the Po Valley, Puglia, Sicily (island), and Verona-Vincenza are important colored-marble-producing areas. About one-half of the production was in block form. Other major marble-producing areas include the Valle di Susa, which is located near Benevento and Turin.

### *Mineral Fuels*

Italy was almost entirely dependent on imports to meet its energy needs. The country's heavy reliance on foreign oil and gas sources, such as Algeria and Libya, made energy security and diversification of energy sources a top concern (U.S. Energy Information Administration, 2004§).

The Government was studying how to fast-track energy reform after the blackout that left most of the nation in the dark. The fast-track measures would include quicker procedures to obtain authorization to build new powerplants, a separate emergency decree that would relax environmental rules on power production, privatization of national networks—the electricity grid, which is wholly owned by Enel SpA, and the gas pipeline which was controlled by Eni S.p.A. (60%). Although State-controlled, Enel and Eni were publicly traded. They would be forced to cut their stakes to below 20% in organizations within 1 year (Alexander's Gas & Oil Connections, 2003§).

The Italcementi Group announced the formation of Italgas S.p.A., which would merge the Group's electrical energy generation and distribution activities across Italy. Italcementi operated three thermal powerplants with a total installed capacity of about 150 MW, 13 hydroelectric powerplants with an installed capacity of about 50 MW, and about 400 km of high-voltage lines. Italgas's responsibilities will entail revamping the existing thermal powerplants to increase their power capacity, raising their environmental and production efficiency standards, and increasing the capacity of hydroelectric facilities to improve renewable energy production (Italcementi Group, 2003b§).

**Coal.**—Cessation of domestic coal production in 2001 made the country heavily dependent on imported coal. Most imports were from, in order of importance, South Africa, Indonesia, Colombia, the United States, and China. Coal consumption in Italy was dominated by power generation, which was increasing, and coke production for steel, which was decreasing. About 7% of Italy's primary energy demand was met with coal (U.S. Energy Information Administration, 2004§).

Lignite was produced by Ente Nazionale per l'Energia Elettrica's Santa Barbara Mine in Tuscany, which was the only lignite mine in Italy.

**Geothermal Energy.**—Geothermal energy was produced in the Larderello, Monte Amiata, and Travale areas in Tuscany. Exploration that used various geologic techniques were being actively pursued in these areas, and research for power stations that exploit geothermal energy was continuing.

**Natural Gas and Petroleum.**—Italy was less than 20% self-sufficient in energy. Italy's oilfields are in the north of the country, onshore and offshore along the Adriatic Sea, and onshore and offshore Sicily. Production from two large fields, Aquila and Villafortuna, declined in recent years. ENI was in the process of developing a 600-million-barrel-equivalent oilfield at Val d'Agri in the southern Apennine region. This was considered to be Europe's most promising onshore development area (U.S. Energy Information Administration, 2003§).

### **Outlook**

Mining of metallic ores is expected to remain at its low level because of ore depletion and will eventually cease altogether. The metals-processing industry, which is based primarily on imported raw materials, is expected to continue to play an important role in Italy's economy. Italy is expected to remain a large producer of crude steel and a significant producer of secondary aluminum in the EU.

The industrial minerals quarrying industry and preparation plants are expected to remain significant especially in the production of barite, cement, clays, fluorspar, marble, and talc. Italy is expected to continue to be the world's leading producer of feldspar, feldspathic minerals, and pumice.

Although production has been relatively stagnant during the past 5 years, domestic outputs of natural gas, crude petroleum, and petroleum refinery derivatives are expected to grow. Italy will continue to depend on imported coal, gas, and petroleum for most of its needs.

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## Major Sources of Information

Associazione Mineraria Italiana  
Via delle Madonne, 20  
00197 Rome, Italy  
Ministero dell'Industria del Commercio e dell'Artigianato  
Direzione Generale delle Miniere  
Via Molise, 2  
00184 Rome, Italy

TABLE 1  
ITALY: PRODUCTION OF MINERAL COMMODITIES<sup>1,\*</sup>

(Metric tons unless otherwise specified)

Commodity	1999	2000	2001	2002 <sup>c</sup>	2003 <sup>c</sup>
<b>METALS</b>					
Aluminum:					
Alumina, calcined basis <sup>c</sup>	973,000	950,000	950,000	925,000	925,000
Bauxite <sup>c</sup> thousand tons	300	300	300	300	300
Metal:					
Primary	187,281	189,800	187,400	190,000	191,000
Secondary	501,800	657,500	574,900	590,000	594,000
Total	689,081	847,300	762,300	780,000	785,000
Antimony oxides, gross weight <sup>c,2</sup>	600	600	600	500	500
Bismuth metal <sup>c</sup>	5	5	5	5	5
Cadmium metal, smelter	360	284	313	390	22 <sup>3</sup>
Copper, metal, refined, all kinds <sup>c</sup>	28,500	72,800	35,500	32,400	26,700 <sup>3</sup>
Gold, mine output, Au content kilograms	600	791	503	600	500
Iron and steel, metal:					
Pig iron thousand tons	10,622	11,219	10,650	9,736 <sup>3</sup>	9,800
Ferroalloys, electric furnace:					
Ferromanganese	19,000	40,000	40,000 <sup>e</sup>	40,000	40,000
Ferrosilicon <sup>c</sup>	12,000	12,000	12,000	12,000	12,000
Silicomanganese	67,000	90,000	80,000 <sup>e</sup>	80,000	80,000
Silicon metal	6,257	5,000	5,978 <sup>r</sup>	6,000	6,000
Other <sup>c</sup>	10,000	10,000	10,000	10,000	10,000
Total	114,257	157,000	147,978 <sup>r</sup>	148,000	148,000
Steel, crude thousand tons	24,964	26,544	26,483	25,930 <sup>3</sup>	26,000
Lead: <sup>c</sup>					
Mine output, Pb content	6,000	2,000	1,000	500	500
Metal, refined:					
Primary	66,954 <sup>3</sup>	75,000	82,000	41,000 <sup>r</sup>	16,000
Secondary	148,354 <sup>3</sup>	160,000	121,000	152,000 <sup>r</sup>	198,000
Total	215,308 <sup>3</sup>	235,000	203,000	193,000 <sup>r</sup>	214,000 <sup>3</sup>
Manganese, mine output, Mn content <sup>c</sup>	1,200	12,000	1,000	500	500
Silver, mine output, Ag content kilograms	4,000	4,000 <sup>e</sup>	3,500 <sup>e</sup>	3,500	3,000
Zinc, metal, primary	145,318	170,300	177,800	175,800 <sup>r,3</sup>	123,100 <sup>3</sup>
<b>INDUSTRIAL MINERALS</b>					
Barite <sup>c</sup>	30,000	30,000	30,000	30,000	30,000
Bromine <sup>c</sup>	300	300	300	300	300
Cement, hydraulic thousand tons	37,391	39,020	39,885	40,000	40,000
Clays, crude: <sup>c</sup>					
Bentonite do.	600 <sup>3</sup>	600	600	600	600
Refractory excluding kaolinitic earth do.	700	700	700	700	700
Fuller's earth do.	30	30	30	30	30
Kaolin do.	100	100	100	100	100
Kaolinitic earth do.	10	10	10	10	10
Diatomite <sup>c</sup>	25,000	25,000	25,000	25,000	25,000
Feldspar <sup>c</sup>	2,700	2,500	2,500	2,500	2,500
Fluorspar: <sup>c</sup>					
Acid-grade	95,000	50,000	30,000	30,000	30,000
Metallurgical-grade	15,000	15,000	15,000	15,000	15,000
Total	110,000	65,000	45,000	45,000	45,000
Gypsum <sup>c</sup> thousand tons	1,300	1,200	1,200	1,200	1,200
Lime, hydrated, hydraulic and quicklime <sup>c</sup> do.	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,500 <sup>r</sup>	2,500
Nitrogen, N content of ammonia do.	367	408	434	391 <sup>3</sup>	400
Perlite <sup>c</sup>	60,000	60,000	60,000	60,000	60,000
Pigments, mineral, iron oxides, natural <sup>c</sup>	500	500	500	500	500
Pumice and related materials: <sup>c</sup>					
Pumice and pumiceous lapilli thousand tons	600	600	600	600	600
Pozzolan do.	4,000	4,000	4,000	4,000	4,000

See footnotes at end of table.

TABLE 1--Continued  
ITALY: PRODUCTION OF MINERAL COMMODITIES<sup>1,\*</sup>

(Metric tons unless otherwise specified)

Commodity	1999	2000	2001	2002 <sup>e</sup>	2003 <sup>e</sup>
INDUSTRIAL MINERALS--Continued					
Salt: <sup>c</sup>					
Marine, crude <sup>4</sup> thousand tons	600	600	600	600	600
Rock and brine do.	3,200	3,200	3,200	3,200	3,200
Sand and gravel: <sup>e</sup>					
Volcanic sand do.	100	100	100	100	100
Silica sand do.	300	300	300	300	300
Other sand and gravel	100,000	100,000	100,000	100,000	100,000
Sodium compounds, n.e.s.: <sup>c</sup>					
Soda ash thousand tons	1,000	1,000	100	100	100
Sodium sulfate do.	125	125	125	125	125
Stone:					
Calcareous:					
Alabaster do.	25	25	25	25	25
Marble in blocks:					
White do.	100	100	100	100	100
Colored do.	3,000	3,000	3,000	3,000	3,000
Travertine do.	2,500	2,500	2,500	2,500	2,500
Other:					
Granite do.	100	100	100	100	100
Sandstone do.	1,800	1,800	1,800	1,800	1,800
Slate do.	100	100	100	100	100
Crushed and broken: <sup>5</sup>					
Dolomite do.	700	700	700	700	700
Limestone do.	120,000	120,000	120,000	120,000	120,000
Marl for cement do.	15,000	14,000	14,000	14,000	14,000
Serpentine do.	1,500	1,500	1,500	1,500	1,500
Quartz and quartzite do.	30	30	30	30	30
Sulfur, recovered as elemental, in compounds, byproducts, other sources do.	678	693	743	725	725
Talc and related materials <sup>c</sup>	140,000	140,000	140,000	135,000	135,000
MINERAL FUELS AND RELATED PRODUCTS					
Asphalt and bituminous rock, natural <sup>c</sup>	30,000	30,000	30,000	25,000	25,000
Coal:					
Lignite thousand tons	19	14	10	10	10
Subbituminous, Sulcis coal <sup>c</sup>	5	5	5	5	--
Coke, metallurgical thousand tons	4,825	5,264	4,829	4,064 <sup>r,3</sup>	4,500
Gas, natural <sup>c</sup> million cubic meters	18,500 <sup>3</sup>	18,500	18,000	18,000	18,000
Natural gas liquids <sup>c</sup> thousand 42-gallon barrels	350	350	350	350	350
Petroleum:					
Crude do.	34,245	29,240 <sup>r</sup>	23,256 <sup>r</sup>	28,424 <sup>r,3</sup>	30,000
Refinery products:					
Liquefied petroleum gas do.	25,404	27,446	27,000 <sup>e</sup>	27,207 <sup>r,3</sup>	27,000
Gasoline do.	174,063	175,576	175,000 <sup>e</sup>	184,280 <sup>r,3</sup>	175,000
Naphtha do.	30,209	30,000 <sup>e</sup>	30,000 <sup>e</sup>	30,983 <sup>r,3</sup>	30,000
Jet fuel <sup>c</sup> do.	25,000	36,440	36,000	36,000	36,000
Kerosene <sup>c</sup> do.	30,000	15,000	15,000	15,000	15,000
Distillate fuel oil do.	271,820	262,226	262,000 <sup>e</sup>	289,913 <sup>r,3</sup>	260,000
Residual fuel oil do.	104,948	100,459	100,000 <sup>e</sup>	105,641 <sup>r,3</sup>	100,000
Other do.	42,042	46,137	46,000 <sup>e</sup>	46,000	46,000
Refinery fuel and losses do.	1,778	1,700 <sup>e</sup>	1,700 <sup>e</sup>	1,700	1,700
Total <sup>c</sup> do.	705,000	695,000	693,000	737,000 <sup>r</sup>	691,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through September 2004.

<sup>2</sup>Antimony content is 83% of gross weight.

<sup>3</sup>Reported figure.

<sup>4</sup>Does not include production from Sardinia and Sicily, which was estimated to be 200,000 metric tons per year.

TABLE 1--Continued  
ITALY: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>, \*

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<sup>5</sup>Output of limestone and serpentine for dimension stone is included with "Stone: Crushed and broken." In addition to the commodities listed, a variety of other dimension stone was produced and previously listed, but available general information was inadequate for continued reliable estimates of output levels.

\*Revised on October 20, 2005.

TABLE 2  
ITALY: SELECTED INDICES OF PRODUCTION

(1995 = 100)

Sector	1998	1999	2000	2001	2002	2003
General	104.3	104.4	107.7	106.8	105.3	104.5
Mining	107.9	107.8	98.4	90.8	104.4	108.5
Manufacturing	103.9	103.6	106.7	105.8	103.7	102.2
Electricity and gas	107.3	111.4	118.3	117.2	120.8	126.6

Source: United Nations, 2004, Monthly Bulletin of Statistics, v. LVII, no. 984, June, p. 16.



TABLE 3  
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Eurallumina S.p.A. (Comalco Ltd., 56.2%, and Glencore AG, 43.8%)	Plant at Portoscuso, Sardinia	1,000
Aluminum	Alcoa Italia S.p.A. (Alcoa Inc., 100%)	Smelters at Porto Vesme, Sardinia, and Fusina, near Venice	188
Asbestos	Amiantifera di Balangero S.p.A.	Mine at Balangero, near Turin	100
Barite	Bariosarda S.p.A. (Ente Mineraria Sarda)	Mines at Barega and Mont 'Ega, Sardinia	100
Do.	Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.	Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto Stefano, and Peppixeddu, Sardinia	
Do.	Mineraria Baritina S.p.A.	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite	Sardabauxiti S.p.A. (Cogein S.p.A., 40%; Comtec, 40%; Icofin Co., 20%)	Mine at Olmedo, Sardinia	350
Bentonite	Industria Chimica Carlo Laviosa S.p.A.	Mines and plant on Sardinia Island, and a plant near Pisa	250
Cement	52 companies, of which the largest are: Italcementi Fabbriche Riunite Cemento S.p.A.	18 plants, of which the largest are Calusco, Monselice, and Collefero	15,000
Do.	Buzzi Unicem Group	11 plants, of which Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello are the largest	9,000
Do.	Cementerie del Tirreno S.p.A. (Cementir)	6 plants at Arquasta Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	5,300
Copper, refined	Società Metalli Marghera S.p.A.	Refinery at Porto Marghera	60
Copper, refined, secondary	Europametalli - LMI S.p.A.	Refinery at Fornaci di Barga	24
Do.	Sitindustrie S.p.A.	Refinery at Pieve Vergonte	22
Feldspar	At least 5 companies, of which the largest are: Maffei S.p.A.	Surface mines at Pinzolo, Sondalo, and Campiglia Marittima; underground mine at Vipiteno	1,500 (200) (300)
Do.	Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.	Sabbie Silicee Fossanova S.P.A. (Sasifo)	Surface mine at Fossanova	(30)
Gold	Gold Mines of Sardinia Ltd., 70%, and Progemisa S.p.A., 30%	Furtei Mine near Cagliari, Sardinia	1,400 <sup>1</sup>
Gypsum	Fassa S.r.l.	Plant at Moncalvo, Asti	90
Lead, metal	Glencore AG	Refinery at San Gavino, Sardinia	100
Do.	do.	Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	35
Lignite	Ente Nazionale per l'Energia Elettrica (ENEL)	Surface mine at Santa Barbara	1,000
Lime	Unicale S.p.A.	Plants in Lombardy region	500
Magnesium, metal	Società Italiana Magnesio S.p.A. (INDEL)	Plant at Bolzano	8
Marble	A number of companies, largest of which include: Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	2,000 (500)
Do.	Industria dei Marmi Vicentini S.p.A.	do.	(300)
Do.	Figaia S.p.A.	do.	(100)
Nitrogen, N content of ammonia	Hydro Agri S.p.A.	Plant at Ferrara	410
Petroleum, crude	Ente Nazionale Idrocarburi (ENI) Government	Oilfields: offshore Sicily, the Adriatic Sea, and onshore in Po River Valley	90
Petroleum, refined	do.	About 30 refineries	2,000 <sup>2</sup>
Potash ore	Industria Sali Otassici e Affini per Azione S.p.A.	Underground mines at Corvillo, Pasquasia, Racalmuto, and San Cataldo, in Sicily (closed)	1,300
Do.	Sta Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700
Pumice	Pumex S.p.A.	Quarries, Lipari Island, north of Sicily	600
Do.	Sta Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.)	do.	200

See footnotes at end of table.

TABLE 3--Continued  
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkahi)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Ponteginori, and Querceto, Tuscany	2,000
Steel	Ilva S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,500)	4,000
Do.	Riva Acciaio S.p.A. (Riva Group)	7 plants	7,000
Do.	Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame S.p.A.)	Steel plant at Vicenza	1,000
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and at Orani, Sardinia	120
Do.	Talco Sardegna S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Glencore AG	Plant at Porto Vesme, Sardinia	60
Do.	Pertulosa Sud S.p.A.	Plant at Crotone, Calabria	100

<sup>1</sup>Kilograms.

<sup>2</sup>Thousand barrels per day.